

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Shin IKEDA et al.) Group Art Unit: 1743
Serial No.: (To Be Assigned))
(DIV of Serial No.: 09/424,715)) Examiner: A. NOGUEROLA
Filed: December 21, 2001)
For: METHOD FOR DETERMINING SUBSTRATE))

PRELIMINARY AMENDMENT

Hon. Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE TITLE:

Please amend the title of the application to read as follows: --A DEVICE AND
METHOD FOR DETERMINING THE CONCENTRATION OF A SUBSTRATE--.

IN THE ABSTRACT:

*Please replace the paragraph beginning at page 33, line 2 with the following
rewritten paragraph:*

--An apparatus for determining the concentration of a substrate in a sample

solution using an electrode system comprising a working electrode, a counter electrode, and a reaction layer which contains at least an oxidoreductase and an electron mediator and is formed on the electrode system to electrochemically measure a reduced amount of the electron mediator resulting from enzyme reaction in the reaction layer, wherein a third electrode is formed as an interfering substance detecting electrode. A current flowing between the counter electrode and the third electrode is measured which is taken as a positive error. Subsequently, voltage application between the counter electrode and the third electrode is released and a voltage for oxidizing the reduced form electron mediator is applied between the working electrode and the counter electrode to measure a current flowing between the two electrodes. --

IN THE CLAIMS:

Please cancel claim 1, and add new claims 8 -12 as follows:

---8. (New) A biosensor for determining the concentration of a substrate in a sample solution, said biosensor comprising:
an electrically insulating base plate;
an electrode system having a working electrode, a counter electrode and a third electrode to be utilized as an interfering substance detecting electrode, said working electrode, said counter electrode and said third electrode being formed on said base plate;
a reaction layer comprising an oxidoreductase and an electron mediator, said reaction layer being formed on said electrode system so as to cover said working

electrode and said counter electrode, said reaction layer not covering said third electrode; and

a cover member forming a sample solution supply pathway to introduce a sample solution from a sample solution supply port into said reaction layer on said base plate, said third electrode being located closer to said sample solution supply port than said reaction layer;

wherein said electron mediator is reduced by the electrons produced by the reaction between the substrate contained in the sample solution and the oxidoreductase, said reduced amount of said electron mediator being measured electrochemically.

9. (New) The biosensor in accordance with claim 8, wherein said working electrode is located closer to said sample solution supply port than said counter electrode.

10. (New) The biosensor in accordance with claim 8, wherein the reduced amount of said electron mediator is determined by measuring a current flowing between said counter electrode and said working electrode.

11. (New) The biosensor in accordance with claim 8, wherein said biosensor is disposed with a layer essentially composed of lecithin on an exposed surface of the sample solution supply pathway of said cover member.

12. (New) The biosensor in accordance with claim 8, wherein said biosensor further contains a hydrophilic polymer in said reaction layer.--

R E M A R K S

The foregoing Preliminary Amendment presents claims directed toward the apparatus of the present invention. As no new matter has been added, entry of the Preliminary Amendment is respectfully requested.

Respectfully submitted,

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Date: 12/21/01

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title of the application has been amended to read as follows: --A DEVICE AND METHOD FOR DETERMINING THE CONCENTRATION OF A SUBSTRATE--.

IN THE ABSTRACT:

The paragraph beginning at page 33, line 2 has been replaced with the following rewritten paragraph:

An apparatus for determining the concentration of a substrate in a sample solution using an electrode system comprising a working electrode, a counter electrode, and a reaction layer which contains at least an oxidoreductase and an electron mediator and is formed on the electrode system to electrochemically measure a reduced amount of the electron mediator resulting from enzyme reaction in the reaction layer, wherein a third electrode is formed as an interfering substance detecting electrode. A current flowing between the counter electrode and the third electrode is measured which is taken as a positive error. Subsequently, voltage application between the counter electrode and the third electrode is released and a voltage for oxidizing the reduced form electron mediator is applied between the working electrode and the counter electrode to measure a current flowing between the two electrodes.

IN THE CLAIMS:

New claims 8 -12 have been added as follows:

8. (New) A biosensor for determining the concentration of a substrate in a sample solution, said biosensor comprising:
 - an electrically insulating base plate;
 - an electrode system having a working electrode, a counter electrode and a third electrode to be utilized as an interfering substance detecting electrode, said working electrode, said counter electrode and said third electrode being formed on said base plate;
 - a reaction layer comprising an oxidoreductase and an electron mediator, said reaction layer being formed on said electrode system so as to cover said working electrode and said counter electrode, said reaction layer not covering said third electrode; and
 - a cover member forming a sample solution supply pathway to introduce a sample solution from a sample solution supply port into said reaction layer on said base plate, said third electrode being located closer to said sample solution supply port than said reaction layer;
- wherein said electron mediator is reduced by the electrons produced by the reaction between the substrate contained in the sample solution and the oxidoreductase, said reduced amount of said electron mediator being measured electrochemically.

9. (New) The biosensor in accordance with claim 8, wherein said working electrode is located closer to said sample solution supply port than said counter electrode.

10. (New) The biosensor in accordance with claim 8, wherein the reduced amount of said electron mediator is determined by measuring a current flowing between said counter electrode and said working electrode.

11. (New) The biosensor in accordance with claim 8, wherein said biosensor is disposed with a layer essentially composed of lecithin on an exposed surface of the sample solution supply pathway of said cover member.

12. (New) The biosensor in accordance with claim 8, wherein said biosensor further contains a hydrophilic polymer in said reaction layer.